1. The reaction of reactant A is zero order. If the initial concentration for the reactant was 0.545 M and the half-life is 236 s, answer the following questions:

A) How much time is required to reduce the initial concentration of the reactant by 65.5 %?

$k = 1.15 \times 10^{-3}$ M/s (from the $t_{1/2}$)

t = 310 sec

B) How much reactant remains after 6.78 min?

0.077 M

C) How much will remain after 4 half-lives?

0.0341 M

D) At what time will the reaction be over?

The reaction is over when the concentration of the reactant reaches zero!

474 s

2. The decomposition of reactant B is zero order. In an initial rate experiment, 0.459 M reactant decomposed with an initial rate of 3.52×10^{-3} M/s. With this information, answer the following questions:

A) What is the half-life of the reactant?

$k = 3.52 \times 10^{-3}$ M/s (from the rate law and the initial rate data)

65.2 s

B) How much time is required to reduce the initial concentration of the reactant by 12.5%?

16.2 s

C) At what time will the reaction be over?

The reaction is over when the concentration of the reactant reaches zero!

130 s

D) In a separate experiment, 0.213 M reactant remained after 57 s. What was the initial concentration of the reactant?

0.414 M